

### REMARKS

Claims 1-40 were pending in the current application. Applicant has amended claims 1-4, 13, and 40. Reexamination and reconsideration of all pending claims as amended are respectfully requested.

#### ***Double Patenting***

The Office Action rejected claims 1 and 7-12 for double patenting based on claims 1, 2, and 8-13 of U.S. Patent 6,980,507. Applicant points to the “wherein” clause of claim 1 and does not specifically agree with the contention that “wherein light emitted from the luminescent layer and received by the detector materially differs when the phase-change layer transforms from the first phase to the second phase” is shown by claim 1 and/or 2 of the ‘507 patent.

Nonetheless, Applicant has amended claim 1 of the application to remove this limitation and substitute in the requirement that “the first phase of the phase-change layer enables transmission of materially more light through the phase-change layer from the luminescent layer to the detector than the second phase of the phase-change layer,” a limitation similar to previous claim 2, a concept missing from the claims of the ‘507 patent.

Applicant submits that by this amendment no double patenting exists with respect to the ‘507 patent and the claims are patentable based on the ‘507 patent.

#### ***§ 112***

The Office Action rejected claim 19 based on the phrase “the beam transmitter for detecting the light emitted from the luminescent layer.” Applicant believes the Office Action misconstrues or misperceives the wording of this limitation, which in its entirety says “**a detector located near the luminescent layer and the beam transmitter** for detecting the light emitted from the luminescent layer.” By this wording, it is not stated that the beam transmitter detects the light emitted from the luminescent layer. This limitation does not omit the “detector,” as alleged in the Office Action (p. 3), but instead the limitation states the detector is (1) located near

the luminescent layer and the beam transmitter, and (2) the detector is “for detecting the light emitted from the luminescent layer.”

Applicant respectfully submits that this limitation is clear by its wording and is sufficiently definite and that all claims fully conform with 35 U.S.C. §112.

**§ 102**

The Office Action rejected claims 1-9 and 11-40 under 35 U.S.C. § 102 based on Terao et al., United States Patent Publication 2003/0218941 (“Terao”).

**Claim 1**

Applicant focuses on the following “wherein” limitation from amended independent claim 1:

*wherein the first phase of the phase-change layer enables transmission of materially more light through the phase-change layer from the luminescent layer to the detector than the second phase of the phase-change layer*

The Office Action rejects this passage based on Paragraph 14 of Terao. (Office Action, p. 4, last paragraph).

First, the claim discusses a “luminescent layer” and a separate “phase-change layer.” These layers are confused within the Office Action in rejecting the passage cited above. The cited Terao passage (Paragraph 14) discusses properties and functionality associated with an “electro-chromic material,” not the phase change layer discussed in, for example, Paragraph 22 of Terao. Paragraph 14 of Terao does not specifically state that a luminescent layer is employed, but rather properties associated with the “electro-chromic material” are discussed. Applicant acknowledges that Paragraph 129 of Terao does discuss replacing the Terao electro-chromic material with an electro-luminescent material, so presumably this “electro-chromic material” allegedly correlates to the “luminescent layer” of claim 1. The phase-change layer is instead discussed at the aforementioned, paragraph 22 of Terao, as noted in the Office Action. The phase-change layer is said to “be disposed between

the electro-chromic layer and the first or second electrode.” Terao, Paragraph 22. In summary, Paragraph 14 of Terao deals with what is alleged to be the “luminescent layer” of claim 1, while Paragraph 22 of Terao discusses features of the alleged “phase change layer.”

With these definitions in mind, and focusing on the “wherein” clause of claim 1 recited above, Applicant first notes that the only change discussed in either Terao paragraph is a change of color, not light transmissivity, and that change is discussed in Paragraph 14, which addresses the electro-chromic material or the “luminescent layer” of claim 1. These color changes (not changes in light transmissivity) do not occur as a result of a change in phases of the Terao “phase change layer”

Applicant’s design materially differs from the Terao design in this respect. As stated in the present specification, bombardment by the beam transmitter results in a change in opacity, or results in the transmission of materially more light through the phase change layer:

Writing data to an ultra-high-density data storage device, such as the one illustrated in FIG. 2, includes transforming one or more portions of the phase-change layer 230 from a transparent first phase to an opaque second phase, or vice-versa, to form respective first-phase regions 250 and second-phase regions 240 in the phase-change layer 230. As discussed above, phase transformations may be effectuated by bombardment of selected regions of the phase-change layer 230 with an electron beam and appropriate subsequent cooling of the bombarded regions. **For example, an optically transmissive, crystalline first phase of a material may become an opaque, amorphous second phase if bombarded by an electron beam with sufficient power density to melt the material and subsequently cooled rapidly enough to quench the material. Similarly, an optically opaque, amorphous first phase may become an optically transmissive, crystalline second phase if bombarded by an electron beam with sufficient power density to heat the amorphous material above its crystallization temperature, thereby annealing the amorphous material.**

Specification, p. 13, l. 18 – p. 14, l. 2 (emphasis added).

This passage, as with the limitation of claim 1, is significantly different from, for example, a material that merely changes color under certain circumstances. The

precise color change effectuated by Terao is not discussed – for example, whether the change in color is from a light yellow to a dark yellow. In any event, a change in color does not materially alter the transmissive properties of the electro-chromic first area or the electro-chromic second area in the Terao design, nor alter the color of photo-chromic materials such as diarylethene, fulgide, etc. as discussed by Terao. In short, a change in color is not a “first phase of the phase-change layer” that enables “transmission of materially more light through the phase-change layer” as required by claim 1, as amended.

Further, Paragraph 14 of Terao discusses color changes to the electro-chromic material, not the Terao phase change layer identified at Paragraphs 22 and 33 in the Office Action. As noted above, the electro-chromic material is said by Terao to be interchangeable with an electro-luminescent material, alleged by the Office Action to be the “luminescent layer” claimed in claim 1, while the phase change layer of Paragraphs 22 and 33 is allegedly the “phase change layer.” Regarding precisely what changes in color, and the result of the color change, Paragraph 14 of Terao says, in its entirety:

(1) A first electrode, an electro-chromic material, and a second electrode are disposed on a substrate of the information recording medium of the present invention, then **a voltage is applied to between the first and second electrodes to flow an electric current in the electro-chromic material, which is thus colored. The information recording medium is preferably configured so that the electro-chromic material is colored in a first area while it is not colored in a second area.** The first area is equivalent to a land area and the second area is equivalent to a groove area. And, because the light is absorbed only in the first area or in the second area, the easily recordable range can be identified. Consequently, information can be recorded in the target place stably regardless of slight changes of the light spot and the light condensing level, thereby the medium can record information fast and permissively to both AF and tracking offsets. The medium can also cope with high density recording.

Terao, paragraph 14 (emphasis added).

This does not say that the Terao phase change layer changes color, but rather the electro-chromic material changes color, said to be interchangeable with the

electro-luminescent layer. From this passage, which recites first and second electrodes and an electro-chromic layer, the Terao design materially differs from the present claim. Color alteration of the electro-chromic material, or specific areas of the electro-chromic (luminescent) layer, is not a “first phase of the phase-change layer” that “enables transmission of materially more light through the phase-change layer from the luminescent layer to the detector than the second phase of the phase-change layer.”

Applicant therefore disagrees that all limitations of the present claim are shown by Terao. Other differences between claim 1 and Terao exist, but this limitation is clearly a significant material difference between claim 1, as amended, and Terao. Terao simply does not show a design where “the first phase of the phase-change layer enables transmission of materially more light through the phase-change layer from the luminescent layer to the detector than the second phase of the phase-change layer.” Thus claim 1, as amended, is not anticipated by Terao. Claims depending from claim 1 are allowable as they depend from an allowable base claim.

**Claims 13, 19, and 40**

Claim 13, as amended, includes the limitation:

*wherein light emitted from the luminescent layer and received by the detector materially differs when the phase-change layer transforms opacity from the first phase to the second phase*

As with claim 1, this is not shown by Terao. Again, if the phase change layer is allegedly the phase change layer of paragraphs 22<sup>1</sup> and 33, the luminescent layer is represented by the electro-luminescent layer of paragraph 129 which Terao states corresponds to the electro-chromic layer discussed in paragraph 14. The changes in color of the first and second areas of the electro-chromic material of paragraph 14 are not a material difference in opacity resulting when a phase change layer changes from a first phase to a second phase, a limitation required by claim 13, as amended.

Changes in color are not opacity differences, and a change in the alleged luminescent layer is not a change in the phase-change layer. Thus for the same reasons as presented above with respect to claim 1, claim 13 is not anticipated by Terao, and claims depending from claim 13 are allowable as they depend from an allowable base claim.

Claim 19 includes the following limitation:

*wherein light emitted from the luminescent layer and received by the detector materially differs when the phase-change layer transforms from the first phase to the second phase*

As discussed above with respect to claims 1 and 13, changes in color for areas of the alleged luminescent layer are not a material difference in light emitted when the phase change layer transforms from a first phase to a second phase. Changes in color are not opacity differences, and a change in the alleged luminescent layer is not a change in the phase-change layer. Thus for the same reasons as presented above with respect to claims 1 and 13, claim 19 is not anticipated by Terao. Claims depending from claim 19 are allowable as they depend from an allowable base claim.

Claim 40, as amended, recites:

*wherein light emitted from the luminescent layer and detected by the detector materially differs when the phase-change layer transforms opacity from the first phase to the second phase*

As with claims 1, 13, and 19, this claimed invention is not shown by Terao. Again, if the phase change layer is allegedly the phase change layer of paragraphs 22 and 33, the luminescent layer is represented by the electro-luminescent layer of paragraph 129 which Terao states corresponds to the electro-chromic layer discussed in paragraph 14. The changes in color of the first and second areas of the electro-chromic material of paragraph 14 are not a material difference resulting when a phase

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<sup>1</sup> Page 7, second paragraph of the Office Action rejects the “phase change layer” based on paragraph 12 instead of 22. Applicant presumes this is a typographical error, as a phase change layer is not discussed in paragraph 12.

change layer changes opacity from a first phase to a second phase, a limitation required by claim 40, as amended. Changes in color are not opacity differences, and a change in the alleged luminescent layer is not a change in the phase-change layer. Thus for the same reasons as presented above with respect to claims 1, 13, and 19, claim 40 is not anticipated by Terao.

Accordingly, it is respectfully submitted that all claims fully comply with 35 U.S.C. § 102.

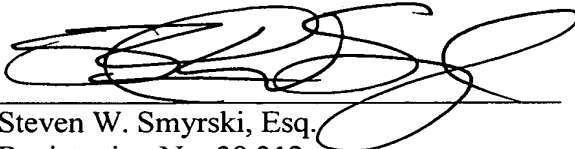
**CONCLUSION**

In view of the foregoing, it is respectfully submitted that all claims of the present application are in condition for allowance. Reconsideration of all of the claims, as amended, is respectfully requested, and allowance of all the claims at an early date is solicited.

Should it be determined for any reason an insufficient fee has been paid, please charge any insufficiency to ensure consideration and allowance of this application to Deposit Account 08-2025.

Respectfully submitted,

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